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THE PLANT DISEASE REPORTER

Issued By

Division of Mycology and Disease Survey

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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

Volume XXVI January 15, 1942 Number 1

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THE WEATHER AND DISEASE SITUATION IN MASSACHUSETTS FOR 1941

O. C. Boyd

Weather Conditions Unusual

Contrasted with the abnormally cold, wet, late spring of last year, the 1941 growing season opened unusually early, warm and dry. Both March and April were far below normal in rainfall (Table 1), and the mean daily temperature for April was 5.3° F above normal. Of the 36 stations that reported daily temperatures for April to the Boston Office of the U. S. Weather Bureau, 11 reported "highest temperature" of 90° F, or higher, the highest one being 93°. It was one of the warmest, driest Aprils on record. Frost in the ground was shallow in most places and came out early. Fruit trees came into blossom from 10 to 14 days earlier than normal.

Table 1. - Rainfall and Temperature Records for March to October in Massachusetts, 1941.

Month	Precipitation (Inches)		Daily Temperature (°F)	
	Mean	Departure from Normal	Mean	Departure from Normal
March	2.37	-1.55	31.0	-3.9
April	1.37	-2.21	50.5	+5.3
May	2.69	-0.59	58.1	+1.6
June	3.98	+0.48	66.4	+1.3
July	4.30	+0.80	70.6	+0.3
August	3.03	-0.67	67.9	-0.6
September	1.11	-2.75	63.5	+1.5
October	2.28	-1.21	53.1	+1.6
Total	21.13	-7.70	-	+7.1

May, although with only about 0.6 inch deficit in rainfall (Table 1), was in effect a warm, dry month, following the tremendous shortage of rain during the March-April period. In fact, all but 11 of the 62 weather stations reported deficits in rainfall for that month. In Table 2, where the precipitation records are grouped according to counties, it is seen that only in Essex County was the rainfall above normal for that month. In the others, the deficits ranged from 7.5 percent to 45.5 percent of normal for those areas. The mean temperature for the State during May was 1.6° F above normal.

The weather during June was peculiar. The mean daily temperature for the 36 reporting stations was 1.6°F above normal for that month. In some sections of the State, the latter part of the month was unusually hot. For example, in Amherst, with the exception of 3 days, the maximum daily temperatures for the period of June 19 to July 2 ranged from 88° to 94°F, with 8 of the days being above 90°. Another unusual feature was the high, continuous wind that lasted from June 8 to 11. It caused severe

damage to newly set tobacco fields and to cucumbers and other tender plants in gardens and fields. Such wind and dust storms usually occur during April or the early part of May.

The rainfall for June was unevenly distributed over the State. In those areas where the spring drought extended through June, the shortage of soil moisture was keenly felt by most garden and field crops. As seen in Table 2, Berkshire County was only slightly below normal in precipitation, but Essex County's rainfall was scarcely 60 percent of normal, while rainfall was above normal for all other county-areas. In fact, Barnstable and Bristol Counties received increases of over 95 percent and 62 percent respectively, above their normals.

July likewise was slightly above normal in both rainfall and mean temperature for the State as a whole (Table 1). Only one county, Middlesex, experienced a deficit for that month (Table 2). Seven of its 8 stations reported deficits, the total shortage for the 8 stations being 29 percent of the normal precipitation. Hampden County received the greatest increase in rainfall above its normal, namely, 47.2 percent.

August rated about as far below as July was above normal in rainfall (Table 1). Each station in Bristol, Essex, Franklin, Middlesex, and Plymouth Counties recorded a deficit for the month. Three of the stations in Hampshire County reported excesses, but the deficit for the fourth station (Amherst) was great enough to more than offset the increases in the other three. Essex and Franklin Counties experienced the greatest deficits in rainfall, namely, 47.1 percent and 43.3 percent respectively (Table 2).

Both September and October were deficient in rainfall for the State as a whole, and their mean temperatures were above normal (Table 1).

All in all, it was an early, warm, dry season. The mean temperature for each month from April to October, except August, was above normal (Table 1), and during the same period the rainfall was below normal for each month except June and July when it was only very slightly above normal. The mean deficit for the State in precipitation for the period of March to October was 7.7 inches, while the departure from the normal mean temperature for the same period was +7.1°F.

Table 2. - Rainfall by Counties for April to August, 1941.

Counties and Months (+)	Stations Reporting (*)	Rainfall (Inches)	Departure from Normal	
			Inches	Percent
Barnstable				
April	3	10.23	- 0.83	- 7.5
May	3	5.59	- 4.66	-45.5
June	3	19.11	+ 9.34	+95.6
July	3	11.27	+ 1.68	+17.5
August	3	13.32	+ 2.88	+27.6
Total	-	59.52	+ 8.41	+16.4

Table 2. (continued) - Rainfall by Counties for April to August, 1941

Counties and Months (+)	Stations Reporting (*)	Rainfall (Inches)	Departure from Normal	
			Inches	Percent
Berkshire				
April	8	5.68	-20.67	-78.4
May	7	20.36	- 4.08	-16.6
June	6	23.58	- 0.26	- 1.0
July	8	42.11	+ 7.10	+20.2
August	5	18.29	- 3.58	-16.3
Total	-	110.02	-21.49	-16.4
Bristol				
April	4	7.99	- 8.10	-50.6
May	4	8.24	- 5.28	-39.0
June	4	20.78	+ 7.97	+62.2
July	4	18.61	+ 4.17	+28.8
August	4	11.44	- 4.65	-28.8
Total	-	67.06	- 5.69	- 7.8
Essex				
April	5	7.37	-12.32	-62.5
May	6	18.55	+ 0.49	+ 2.9
June	6	12.48	- 8.71	-41.1
July	5	19.10	+ 2.44	+14.6
August	6	10.95	- 9.76	-47.1
Total	-	68.45	-27.86	-28.9
Franklin				
April	4	3.49	-10.59	-75.2
May	4	8.95	- 5.00	-33.4
June	3	12.39	+ 2.66	+26.0
July	4	17.07	+ 2.55	+17.5
August	4	8.65	- 6.62	-43.3
Total	-	51.05	-17.00	-24.9
Hampden				
April	4	3.10	-11.64	-79.0
May	4	11.15	- 3.10	-21.7
June	3	13.53	+ 2.72	+25.1
July	4	22.59	+ 7.25	+47.2
August	4	12.95	- 3.98	-23.5
Total	-	63.32	- 8.75	-12.1
Hampshire				
April	4	2.87	-11.45	-80.0
May	5	17.90	- 1.46	- 7.5
June	4	20.03	+ 3.59	+21.8
July	4	21.91	+ 4.91	+28.8
August	4	15.96	- 0.75	- 4.5
Total	-	79.67	- 5.16	- 6.0

Table 2, (continued) - Rainfall by Counties for April to August, 1941

Counties and Months (+)	Stations Reporting (*)	Rainfall (Inches)	Departure from Normal	
			Inches	Percent
Middlesex				
April	8	9.85	-20.97	-68.0
May	8	18.84	- 6.19	-24.7
June	8	25.64	- 2.89	-10.1
July	8	24.18	- 4.04	-14.3
August	8	22.20	- 7.24	-24.5
Total	-	100.71	-41.33	-29.0
Plymouth				
April	5	12.85	- 6.72	-34.3
May	5	15.16	- 0.04	- 2.5
June	5	24.57	+ 8.06	+48.8
July	5	20.83	+ 2.61	+14.3
August	5	12.53	- 6.17	-33.0
Total	-	85.94	- 2.26	- 2.5
Worcester				
April	16	15.77	-43.55	-72.9
May	16	44.14	- 6.96	-13.6
June	15	48.34	- 3.92	- 9.2
July	17	72.21	+ 6.09	+ 9.1
August	16	52.64	-11.86	-18.3
Total	--	233.10	-60.20	-20.5

(+) Only those counties with 3 or more stations reporting.

(*) Reporting stations:

Barnstable Co.: - Hatchville, Hyannis, Provincetown.

Berkshire Co.: - Peru, Pittsfield, So. Egremont, Stockbridge, West Otis, Williamstown.

Bristol Co.: - Fall River, Mansfield, New Bedford, Taunton.

Essex Co.: - Gloucester, Haverhill, Ipswich, Lawrence, Swampscott, Rockport.

Franklin Co.: - Heath, Montague City, Shelburne Falls, Turners Falls.

Hampden Co.: - Chester, Holyoke, Springfield, Westfield.

Hampshire Co.: - Amherst, Chesterfield, Plainfield, Ware, West Cummington.

Middlesex Co.: - Ashland, Concord, Framingham, Groton, Lowell, Lake Cochituate, Spot Pond, Weston.

Plymouth Co.: - Brockton, E. Wareham, Middleboro, Pembroke, Plymouth.

Worcester Co.: - Boylston, Clinton, Fitchburg, Gardner, Hardwick, Hubbardston, Jefferson, Milford, Northbridge, Petersham, Princeton, Southbridge, Sterling, Webster, West Rutland, Winchendon, Worcester.

The Disease Situation

Owing to the dry season, most plant diseases caused by fungi, bacteria, and slime molds were scarce and light, particularly those that ordinarily start during April and May, or in some sections of the State, this year, even during June. Notable among them were Botrytis blights of tulip and peony [Botrytis tulipae, B. paeoniae] anthracnose of sycamore and white oak [Gnomonia veneta] Gnomonia leaf spot of elm [G. ulmea], leaf blotch of horsechestnut [Guignardia aesculi], leaf spots of maples, bacterial blight [Phytomonas syringae],and anthracnose*[G. aridum] and rust [Puccinia peridermiospora] of ash; also the black spot diseases of delphinium [Phytomonas delphinii] and of rose [Diplocarpon rosae].

The general rainy period during May 8-10 constituted the first general infection period of the season for plant parts above ground. It occurred around mid-bloom for apple orchards.

Fruit diseases ordinarily of considerable importance, that were unusually scarce and easily controlled include scab, frog-eye leaf spot and cedar-apple rust of apple [Venturia inaequalis, Physalospora obtusa, Gymnosporangium juniperi-virginianae]; scab and curl of peach and brown rot of stone fruits [Cladosporium carpophilum, Taphrina deformans, Sclerotinia fructicola], Botrytis fruit rot of strawberries and spur blight and anthracnose of raspberries [Botrytis cinerea, Didymella applanata, Elsinoë veneta]

Vegetable diseases that were either absent or of slight importance in most sections were early blight, late blight, and Septoria leaf spot of tomato [Alternaria solani, Phytophthora infestans, Septoria lycopersici]; early and late blights of celery [Cercospora apii, Septoria spp.]; downy mildews of lettuce, cucurbits, spinach and onion [Bremia lactucae, Pseudoperonospora cubensis, Peronospora effusa, P. destructor]; early blight of potatoes [Alternaria solani], and Macrosporium leaf blight, scab, and anthracnose of muskmelons [Alternaria cucumerina, Cladosporium cucumerinum, Colletotrichum lagenarium]. Tobacco wildfire and angular leaf spot [Phytomonas tabaci, P. angulata] likewise were less prevalent this year than usual.

Diseases That Were About Normal: These included Rhizoctonia sprout rot, scab, black leg, and virus diseases of potato, and even potato late blight in Bristol County and in the three Connecticut River Valley counties [R. solani, Actinomyces scabies, Erwinia phytophthora, Phytophthora infestans]; bacterial leaf spot of peach and plums and quince rust on apple in Bristol and Barnstable Counties [Phytomonas pruni, Gymnosporangium clavipes]; common leaf spot and spring dwarf of strawberries on Cape Cod [Mycosphaerella fragariae, Aphelenchoides fragariae]; scab [C. cucumerinum] of cucumbers in Western Massachusetts; and bacterial wilt of cucumbers, squash, and melons generally [Erwinia tracheiphila].

Diseases Unusually Severe: The heaviest and most widely distributed outbreak of cucumber angular leaf spot [Phytomonas lachrymans] occurred that has been observed during the past 12 years. Although it was most pronounced in the pickle growing area of the Connecticut River Valley, it was observed also in Bristol, Plymouth, and Worcester Counties. In

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* Insert before [G. aridum]: "[Gloeosporium syringae] of lilac, and anthracnose"

most seasons it is either totally absent or extremely scarce. It appeared not to be limited to crops grown from non-disinfected seed or to fields where cucurbits were grown in 1940. As in former years, only traces of fruit infections were observed.

Cucumber mosaic [virus], likewise, appeared to reach a new high level of damage to slicing and pickling cucumbers this year, at least throughout the Connecticut Valley as well as in various other sections of the State. Like bacterial wilt, it appeared to be directly associated with high populations of the striped cucumber beetle, both diseases being of slight importance where the beetles were scarce.

The X disease (yellow-red virosis) of peach appeared to be unusually conspicuous on the native chokecherry. The yellow-to-red colors appeared earlier in the season than usual and were unusually brilliant. Furthermore, the disease was observed farther north in Franklin County on both peaches and chokecherries than in past seasons. Colored chokecherry bushes were present along the highways from Amherst to Brandon, Vermont. Surveys again this year failed to reveal the disease in Barnstable, Bristol, Essex, and Plymouth Counties.

Downy mildew [Peronospora tabacina] and damping-off in tobacco beds were somewhat more severe than in most past seasons. Bacterial ring rot [Phytomonas sepedonica] of potato was far more prevalent than in past years, particularly in the Connecticut Valley and in Bristol County. In the latter county, several lots of non-certified seed from Maine that contained ring rot were planted in the Westport-Dartmouth section. In the former area, the disease had its origin in several carloads of certified Chippewa seed potatoes from Maine. Infected tops varied from 10 percent to 50 percent of the hills, but the amount of tuber decay in most cases was less than expected, usually under 10 percent. One grower in Franklin County, however, reported a loss of at least one-third of his crop from tuber decay. The same fields of Chippewa potatoes in the Connecticut Valley contained mostly from 50 percent to 90 percent leafroll in addition to the bacterial ring rot. The yields in most of those fields were no more than one-third to one-half normal for the season concerned. Evidently there occurred a slip somewhere in the channels of certification that allowed such stock to be shipped under certificate tags.

New and Unusual Diseases: The Fusicoccum canker [F. amygdali] of peach in Plymouth County appeared to be much more damaging to the orchard in June than was indicated in April (U. S. Plant Dis. Rptr. 25: 9:273, 1941). No additional cases were encountered during the season. Strawberry red stele (Phytophthora fragariae], identified for the first time this year in Massachusetts (and confirmed by J. B. Demaree, U.S.D.A.) outside of experimental plantings, appeared to be restricted to a few fields in Bristol County. First observed around mid-June, it was confined mostly to Howard 17 and to fields where strawberries had been grown in recent years. Following the wet season of 1940, rainfall for June this year in Bristol County likewise was far above normal, thus no doubt favoring the further development of the disease wherever the fungus was established.

Black pox of apple [Helminthosporium papulosum], reported earlier in the year from Plymouth County (U. S. Plant Dis. Rptr. 25:8:249, 1941),

was examined during August in the original orchard. Branch infections were heavy on Red Astrachan, moderate on Red Delicious and Northern Spy, light on Wealthy, and absent on McIntosh, Baldwin, Gravenstein, Dutchess, King, and Stayman Winesap. Leaf infection was present on Red Astrachan only, and no fruit spots were observed at all. This small orchard was in rather low vigor and had received only partial spray programs in past years. In a larger, better-managed orchard in Marshfield, Red Astrachan trees showed only light bark infections and no leaf spotting, while Northern Spy and several other varieties were entirely free of black pox. In October, a grower from Fall River, Bristol County reported that the bark stage of the disease has been present for several years on a few trees in his orchard.

Bacterium vesicatorium [Phytomonas vesicatoria] spot commonly occurs on peppers in Massachusetts practically every year, but this is the first time during the past 12 years I have observed it on tomatoes. The disease was present in Worcester County where the infection was heavy on Victor and light on two other varieties growing nearby. On Victor, about one-fourth of the leaves were dead and most of the remainder spotted, while at least three-fourths of the fruits were moderately to heavily spotted. The grower stated the disease was present only on Victor in the plant bed. The only treatment the seed had received was a dusting with cuprous oxide for damping-off control. Oddly, the disease was not observed elsewhere in the State, even in Bristol County where the weather was much damper this year and where Victor, obtained from the same seedhouse was being tried out on several farms.

This is the first season, also, during the past 12 years that cabbage yellows [Fusarium conglutinans] became a problem. It was present in Essex County in every field visited during mid-season, where plant infections ranged from 5 to 75 percent. The heaviest loss was estimated at 25 to 30 percent. Growers in that area reported they had observed it from time to time during the past 15 years but that in most years the losses had been very light. On one farm where the seed of several varieties was sown in one field and a portion of the plants transplanted in other fields, Penn State and Golden Acre were heavily infected while Copenhagen (probably a resistant strain) showed only light symptoms on a very small number of plants. Two very light infections were observed also in Hampden County and one in Middlesex County, the only ones outside the extensively infected area of Essex County.

Sphaceloma scab of Plantago (plantain) was first identified (and confirmed by Anna E. Jenkins) in Massachusetts this year. The disease was observed in several parts of the State. A specimen of bacterial leaf blight (cause undetermined) of plantain lily was submitted from Plymouth County during June. A specimen of rose cane showing coryneum gall and canker (apparently C. microstictum) was submitted during June from Walpole, New Hampshire, and identified by B. H. Davis, New Jersey.

In Bristol County, where rainfall was above normal during June and July, one field of cucumbers in Dighton showed marked drooping of the leaves of nearly all of the plants during mid-July. The plants would recover at night and wilt during the day, but only a very few of them had died outright. All affected plants that were examined showed a yellowish

discoloration of the xylem vessels in the crown and in the tap and lateral roots. Tissue plantings yielded a Fusarium identified tentatively by C. D. Sherbakoff as a variety of Fusarium niveum [F. bulbigenum niveum]. The disease was unlike anything observed here previously in cucumbers.

Only occasionally during past years has bitter rot [Glomerella cingulata] of apples been observed in Massachusetts, and then only in the southeastern part of the State. One severe case of fruit infection was observed in Bristol County on Rhode Island Greening. Some of the fruits were literally freckled with small lesions, resembling apples heavily affected with Jonathan spot. Others showed only a few typical, large lesions with the characteristic concentric rings of spore pustules. The orchard concerned received the complete schedule of sulfur sprays, but with inadequate dosage and distribution of spray material. Like Brooks' spot [Mycosphaerella pomi], which also occurs mostly in the three southeasternmost counties, bitter rot has never been observed even there to reach destructive proportions in orchards that are given year after year a spray program that is scab-tight for McIntosh.

One case of the nematode disease, spring dwarf of strawberries, was observed outside Cape Cod, a very light infection on Fairfax in Bristol County (Confirmation by J. R. Christie, U.S.D.A.).

Possible Reasons for Unusual Diseases: As indicated in Table 1 on page 2, the mean temperature for the State was above normal for each month from April to October except in August when it was about normal. The greatest departure from normal was during April, +5.3°F, when the soil no doubt warmed up considerably and then apparently remained unusually warm through June and July. This situation probably accounted for the unusual incidence of cabbage yellows in which the fungus is reported to be active only at temperatures above 63°F, and to reach its most favorable range of growth at 80-90°F. Ordinarily, the disease is of little or no consequence, even when susceptible varieties are grown, in the southern and northernmost States where the soil temperatures are too high and too low, respectively. The same warm season may be the explanation also for the presence of apple bitter rot and of the cucumber fusarium wilt in Bristol County, and possibly also for the outbreak of cucumber and tomato bacterial leaf-spot diseases.

The normal or above normal situations for several diseases in Bristol County might well be explained by the marked excesses of rainfall in June and July (Table 2), together with the heavy dews and fogs that usually prevail there during July and August. Scattered, light secondary infections of potato late blight were observed July 3. The disease assumed epidemic form during mid-July and destroyed many unprotected fields, but remained relatively inactive until the first week of August when it again developed freely on unsprayed or poorly sprayed vines. The only definite cases of tomato late blight reported in the State this year were observed there early in August; and at the same time cucumber downy mildew was spreading freely. In fact, there were indications on one farm in Dighton that this disease, which was not observed elsewhere in the State until the first week of September, had become established around mid-July.

Weather conditions were even more favorable for diseases in Barnstable County (Table 2) than in Bristol County, but very little information is available concerning losses because of the few and limited surveys made there. Disease losses were none-to-negligible in Essex, Middlesex, and Worcester Counties, excepting those due to underground infections, such as Rhizoctonia sprout rot and scab of potato and cabbage yellows, and excepting mosaic and bacterial wilt of the cucurbits. A glance at the rainfall records for those counties in Table 2 will reveal the marked summer drought conditions that prevailed, particularly in Middlesex and Worcester Counties.
(MASSACHUSETTS STATE COLLEGE)

FRUIT DISEASES IN IDAHO IN 1941

Earle C. Blodgett

The following list of fruit diseases has been compiled from the records of inquiries and of field observations on occurrence and prevalence during 1941. Most of the notes were made during field trips of June 10 to 26, July 9 to 14, July 30 to August 3, August 18 to 21, and September 1 to 13. These trips were not strictly of a survey nature and the following records were taken incidental to other work. Thus the list is complete only in that it includes all diseases observed in 1941. The report is similar to those for 1936-1940.

Parasitic Diseases

1. Coryneum blight (Coryneum beijerinckii Oud. [=Coryneum carpophilum (Lév.) Jauch] of peach did more damage this year than ever reported before. Fruit infection with severe gumming was the most important type of injury. Twig cankering was particularly bad on some trees. (February - September).
2. Coryneum blight of apricot was general, causing leaf and fruit spotting. (June - July).
3. Coryneum blight of sweet cherry caused more damage than ever noted before. Infection was severe in some orchards of Lewiston, Orofino, and in one at Caldwell. Leaf spotting and fruit infection caused a heavy leaf fall and considerable loss of fruit. (May - July).
4. Cornyeum blight of sour cherry caused heavy leaf fall and fruit infection in some orchards at Lewiston. This represents the first record of this disease on sour cherry in Idaho. Greenhouse tests this year gave abundant leaf spotting of Montmorency cherry with isolates of Coryneum. (April - July).
5. Coryneum blight of prune (both Italian and French) was very bad in a small planting near Troy and one at Caldwell. Although the foliage was covered with lesions, the leaves did not fall. Fruit infection was very common especially on the French prune. This is the first record of extensive natural infection of prune in Idaho. (June - July).

6. Powdery mildew (Podosphaera spp.) was less severe on sour cherry in orchards near Weiser. (June - September).
7. Powdery mildew of Jonathan apple caused some damage at Emmett and Caldwell and was common at Council. (June - August).
8. Powdery mildew (Sphaerotheca mors-uvae (Schw.) Berk. and Curt.) of gooseberry was found on plants at Moscow and Emmett. (May - June).
9. Powdery mildew (S. pannosa (Wallr.) Lév.) of peach was an important disease generally. One grower reported that upon removing two heavily infected nectarine trees from a peach orchard, powdery mildew became of much less importance. (June - September).
10. Powdery mildew (S. humuli (DC.) Burr.) on raspberry was noted at Moscow. (June).
11. Fire-blight (Erwinia amylovora (Burr.) Winslow) of pears was severe this year. In artificial inoculation field tests at Moscow many trees were completely killed. (May -September).
12. Fire blight of apple was widely scattered as blossom blight and twig killing. (June).
13. Fire blight was severe on quince at Lewiston and Moscow. (May - June).
14. Crown gall (Phytomonas tumefaciens (Erw. Sm. & Towns.) Bergey et al.) of boysenberry canes caused extensive damage in plantings at Emmett, Fruitvale, and Sandpoint. The disease was also noted at Moscow on loganberry and blackberry. (May - August).
15. Crown gall was noted on cherry at Moscow. (April).
16. Crown gall was noted on pear at Moscow. (March).
17. Perennial canker (Neofabraea perennans (Zeller & Childs) Kienholz) was common on apple trees and fruit in northern Idaho orchards. Cankers were found also on Jonathan at Council and considerable damage was noted on stored fruit near Boise. This represents the first record of the disease in southern Idaho. (February - August).
18. Leaf curl (Taphrina deformans (Berk.) Tul.) on peach caused almost complete defoliation of unsprayed trees in northern Idaho. It was more serious this year in southern Idaho also.
19. Leaf spot, cane canker, and dieback of youngberry, boysenberry, and blackberry were serious as usual in most plantings. (Septoria spp. and Glomerella cingulata (Ston.) Spauld. & Schrenk.) These diseases are regarded as one of the most important limiting factors in youngberry and boysenberry production in Idaho. (June - August).
20. Currant anthracnose (Pseudopeziza ribis Kleb.) caused complete defoliation of red currant plants at Moscow. It was noted also at Sandpoint. (May - August).
21. Strawberry leaf spot (Mycosphaerella fragariae (Tul.) Lindau) was widespread and did considerable damage. (March - June).
22. Strawberry leaf scorch (Diplocarpon earliana (Ell. & Ev.) Wolf), tentatively identified in Idaho since 1937, did considerable damage in one planting near New Meadows this year. Dr. A. G. Plakidas positively identified the fungus on material collected September 1941.
23. One of the slime molds (not determined) caused considerable anxiety to the grower when about 10 percent of the plants in a commercial strawberry planting near Caldwell were attacked. Development of the fungus was noted about the last of harvest and could still be found in September. Although the fungus is probably not parasitic in the usual

sense it caused some damage to the plants and in the event of earlier development could seriously affect the crop.

24. Blue mold rot (Penicillium expansum (Lk.) Thom.) was common on many hosts. (Storage and shipping seasons).
25. Black mold rot (Rhizopus nigricans Ehr.) was severe on peaches, prunes, and late strawberries. (September - October).
26. Apple scab (Venturia inaequalis (Cke.) Wint.) was generally present in northern Idaho and more prevalent than usual. (June - August).
27. Brown rot (Sclerotinia sp.) was common and caused extensive damage to sweet cherries at Lewiston and on prunes and apricots at Moscow. The disease apparently is now well established in the Lewiston district and this represents the first record of brown rot in commercial orchards in Idaho. (May - June).
28. Several peach trees on the Salmon River below Salmon City were killed by a root rot. Although identification is not positive, Armillaria mellea Vahl ex Fr. is probably involved. The affected trees were located on recently cleared land.

Non-Parasitic Diseases

1. Winter injury was very slight again this year.
2. Black end of pear was noted as usual. (September).
3. Drought spot or gum spot of prunes was general but not uniform in occurrence. (September).
4. Cracking of sweet cherries was extremely severe in the Lewiston, Emmett, and Caldwell sections. The injury complicated packing and shipping operations because of rot fungi. (June).
5. Drought spot and corky core of apples was less severe this year. (August - September).
6. Bitter pit was noted at St. Maries. (August).
7. Lime-induced chlorosis was much more severe this year than last. Pears, apples, and small fruits were seriously affected.
8. Spray injury. The season was characterized by severe damage to apples, prunes, and peaches in many orchards.
   (a) In orchards at St. Maries, Wilder, and Meridian some apple trees were nearly defoliated in August and September. Excessive rainfall and heavy arsenical spray applications presumably accounted for the unusual damage. In some cases fruit burning occurred in the field.
   (b) Generally, where calcium arsenate was dusted on prunes for the control of the snowy tree cricket, severe damage occurred. The burning and defoliation was definitely correlated with the periods of excessive moisture. Loss of foliage frequently caused the prunes to shrivel and fall prematurely. Much of the leaf spotting could not be distinguished from that known as prune leaf spot perpetuated in budded stock (Phytopath. 40: 347-348. 1940).
   (c) Peach trees sprayed with arsenate of lead for twig borer showed mild to severe leaf and twig damage from arsenical burn. Where peaches were interplanted with apples almost complete defoliation frequently occurred.

9. The leaf spotting and defoliation of apricot and peach noted for several years has been shown to be due at least in part to arsenical residues in the soil. The disease has been named systemic arsenic toxicity (PDR 25:549-551. Dec. 1, 1941). Injury was not quite so severe this year.
10. Extensive loss of young prune trees was observed in one orchard and reported from others, due to injury from the use of ethylene dichloride for control of peach borer. In the case noted, the operator used the solution recommended for old trees on younger replants and adjoining young trees. The trees died any time during the season following application and losses often amounted to over 50 percent.

Virus Diseases

1. Raspberry mosaic (types not separated) was as serious as usual. Mosaic was also recorded on all other common types of brambles. One very severe case of mosaic on blackberry was noted at Boise.
2. Cherry mottle leaf was noted in widely scattered places. Decline in vigor of affected trees was especially marked in an orchard at Council. One new tree was located at Emmett, the first record in that area.
3. Peach mottle was observed on the original tree at Emmett, but no new cases were observed. When buds from mottle-infected trees are placed on healthy Bing and Montmorency cherries, a severe mottling and necrosis of foliage occurs on the Bing and a terminal die back and gumming of twigs result on the Montmorency.
4. Peach wart has been shown by many budding and inarching tests during the past two years to be caused by a transmissible factor, probably a virus. In one orchard there are several new trees affected this year and injury is more severe on others. Variations in symptoms have given rise to terms such as beady wart, ring wart, and smooth wart. No tree symptoms are recognized except that one tree bearing warty fruits shows mottled foliage very similar to peach mottle.
5. The disease under observation and test since 1936 is now definitely regarded as the Western X-disease. Transmission tests in 1940 and 1941 showed successful transmission from peach to peach. Western X-disease is regarded as one of the most serious disease of peach in Idaho and losses have already been considerable.

Miscellaneous Diseases - Causes Undetermined

1. Strawberry
   (a) The "mildew-like" growth on petioles, pedicels, and fruit was noted on one lot of specimens sent in again this year. Cause is not determined.
2. Italian Prune
   (a) Leaf curl was noted as usual. Evidence accumulated by entomologists indicatesthat the type of leaf curl referred to here (and in earlier reports) is caused by the feeding of certain mites.

(b) Leaf spot was severe again this year and considerable damage to ripening fruit was caused by early defoliation. Transmission tests show that all shoots from diseased buds developed leaf spot but the stocks remained normal. The type of injury was difficult to distinguish from that due to arsenical burn. (See spray injury).

(c) The chlorosis and malformation of prune foliage in the orchard near Weiser is probably a form of rosette (zinc deficiency).

(d) The leaf deformity of Italian prune at Fruitland is still under test.

(e) A condition referred to as gherkins or prune pickles was noted but there apparently was no damage.

(f) A peculiar condition on Italian prune was seen in September in a young orchard near Payette. Several trees either partly or completely dead showed an abundant, rusty thin exudate on the main branches and trunk. The trees wilted suddenly with the leaves persisting as in fire-blight but no definite cankers were found. The writer has never seen a similar type of disease and the prominent residue from the exudate is very interesting. Preliminary isolation tests were not successful.

(g) Enlarged nodes is a term given to a condition of Italian prune twigs which has been observed many times. Some trees are more affected than others and usually there is great variation in each tree. The tissue below the bud "puffs out" to 2 or 3 times the normal twig size. No apparent injury is associated.

3. Apricot

(a) The leaf blotch condition previously noted is now regarded as caused largely by arsenical residues in the soil. (See non-parasitic diseases, No. 9).

(b) The trouble noted at Weiser is probably a form of rosette (zinc deficiency).

(c) The so-called physiological spotting of apricot fruit was again general.

(d) The die back, defoliation, and leaf deformity condition reported last year on the tree at Bonners Ferry was not present this year.

(e) Loss of young trees in certain orchards, sometimes exceeding 50 percent, was noted this year. Cankers on trunk and main branches often produced complete girdling. The diseased area extended about to the ground level and the roots and crown generally were uninjured. The disease has been tentatively regarded as bacterial gummosis.

4. Cherry

(a) The diagnosis of the trouble on suspicious trees near Weiser is not certain but similar to those of pink fruit.

(b) The cherry rosette trouble near Weiser noted for several years is probably due to zinc deficiency.

(c) The red leaf of chokecherry is widespread and "seems" to be associated with the Western X-disease of peaches.

(d) Extreme fasciation of young sweet cherry trees at Moscow was noted.

(e) Loss of young trees in many widely scattered orchards has been serious this year. Symptoms appear to be similar to those of bacterial gummosis. (See Apricot (e)).

(f) In one orchard at Twin Falls many old, mature trees died outright during the summer. After limited observations no good explanation of the cause could be made. Such a sudden extensive loss is probably not due to natural old age.

5. Peach
   (a) Western X-disease (See virus diseases).
   (b) Systemic arsenic toxicity. (See non-parasitic diseases).
   (c) One new case of calico was noted this year.
   (d) Wart. (See virus diseases).
   (e) The rough bark condition has increased in severity in the orchards where noted.
   (f) "Yellow spot" on peach foliage was noted for the first time in an orchard in southern Idaho. It was less severe at Moscow.
   (g) Extreme development of the bluish-green color on peach foliage was noted on the trees in the Station orchard at Parma.
   (h) The marginal leaf spot trouble was less severe this year.
   (i) A trouble seen before but not reported was serious this year in two orchards near Caldwell. Excessive gumming occurred around pruning wounds and bark splits on the main branches. Although similar to "rough bark" it seems to be distinct.
   (j) Rusty spot was worse this year in the two places where it has been observed. Tests are under way to determine the cause.

6. Apple - The collar rot reported last year continues to be a problem but no studies have been made.

The 1941 season was characterized by a pronounced increase in the amount of damage done by parasitic diseases, particularly those caused by fungus parasites. This is probably due to more moist weather than usual and a build up of inoculum. The wet weather likewise probably accounts for unusual arsenical damage.

(IDAHO AGRICULTURAL EXPERIMENT STATION, MOSCOW)

DISEASES OF FRUITS AND VEGETABLES ON THE NEW YORK MARKET DURING THE MONTHS OF JANUARY TO AUGUST, INCLUSIVE, 1941

C. C. Bratley and James S. Wiant

APPLES

Internal browning of Eastern-grown Rhode Island Greening Apples was more severe than has been noted in any recent year on the New York market. During January the disease was found in a few lots grown in Western New York and by February it was general in Greenings from this district. In 12 carlots examined during the latter month, approximately 10 percent of the apples had flesh that was browned severely enough to affect their market demand.

Apples in one carlot held in storage at New York were examined periodically. About 5 percent were found affected by the first week of February, 8 percent by the last week of February, and 23 percent by the last week of March. Fruit removed from storage at the time of the two latter examinations and held at room temperature (70°F) for 6 days, showed over half again as much browning as when removed. Large fruits were more generally affected than small ones. Apples showing blush areas on the skin were less affected than entirely green fruits.

Blue mold rot (Penicillium expansum) continued to be the most important decay found in apples from Washington and Oregon. Of the 385 cars of apples from this district inspected by market inspectors 1/ during the period from January to May, only 17 were free from the decay and in the remainder an average of 2.7 percent of the fruits were affected.

ASPARAGUS

Phytophthora rot (Phytophthora sp.) and bacterial soft rot (Erwinia carotovora) were of importance on California asparagus during the first week or 10 days of the season which extended roughly from early March to early May. For 3 weeks thereafter practically no decay occurred. Then throughout the final 3 or 4 weeks of the season both decays were again prominent.

An examination of terminal inspection records 1/ covering 136 carloads showed that phytophthora rot alone was reported in 16 cars, bacterial soft rot alone in 17 cars, while both occurred together in 41 additional cars. An average of 3 to 4 percent of stalks were affected in the 74 carloads, with the two decays assuming about equal importance.

CAULIFLOWER

Ring spot (Mycosphaerella brassicicola) occurred as an important blemish of the jacket leaves of California cauliflower arriving on the market in early April.

CELERY

Throughout January and February considerable pithiness was noted in the outer leaf stalks of California celery. During this period market inspectors 1/ reported the defect in over half of the cars, with an average of 19 percent of the stalks showing 3 to 5 outer leaf stalks so affected. Bacterial soft rot (Erwinia carotovora) and watery soft rot (Sclerotinia sclerotiorum) were reported prevalent from the first of the year clear through the season which after mid-February continued in light degree through March, April, and May. A summary of the reports indicated an average of 14 percent decay in 141 cars out of a total of 169. Much of this occurred in early stages with only portions of the leaves and small leaf branches affected. Late blight (Septoria apii-graveolentis) was found in high amount during the latter part of the season.

1/ These data are based on condition inspection reports issued by the U. S. Agricultural Marketing Service. They cover most of the carloads handled by a given group of receivers. There is represented, therefore, a good cross-section of the total market receipts of this commodity.

Florida celery was even more severely affected with pithiness during the first two months of the year. Thus inspection records indicate an average of 34 percent of the bunches with 3 to 5 outer leaf stalks affected in 87 of the 120 carlots examined. Very little was found during March, April, and May. Decay (both bacterial soft rot and watery soft rot) was found to an average extent of 6 percent in 77 cars out of a total of 411 inspected during the entire 5-month period. Both early blight and late blight were found in a few cars.

Celery from both States was practically free of blackheart, the disease being observed in an occasional car.

CHERRIES

California cherries arriving on the New York market were more severely affected with brown rot than in any of the ten previous seasons during which observations have been made. Frequently 20 to 40 percent of the fruit in a lot was affected. During the marketing period of 2 or 3 days at summer temperatures, the percentage of infection increased greatly so that certain lots became unsalable because of brown rot. Isolations made from infected cherries selected at random over a period of several weeks revealed that most of the rot was caused by Sclerotinia fructicola. About 3 percent of the cultures proved to be S. laxa.

ENDIVE (Chicory)

A car of Arizona endive received at Albany in early February was seriously affected with tipburn. In approximately 60 percent of the heads many leaves were speckled with scattered reddish spots over the midribs and had a similar reddish discoloration along their margins and tips.

ONIONS AND GARLIC

Sclerotium bataticola was found causing a dry rot of the outer scales of a single Valencia-type Texas onion bulb observed in early July. The lesion was approximately one inch in diameter and occurred near the base of the bulb. Normal brown pigment had disappeared over the affected area of the scales, which were papery thin, ash gray in color, and covered with the minute sclerotia of the pathogen.

The same fungus had previously been found affecting the outer scales of Chilean garlic received in early April.

Although in neither instance was the decay of commerical importance, the occurrence of the fungus on onion and on garlic is of unusual interest.

ORANGES

Diplodia and Phomopsis stem-end rots of citrus fruits from Florida, which usually take heavy toll in late spring shipments, were found in unusually small amounts this season.

PEAS

Anthracnose (Coletotrichum pisi) was found in a carlot of Texas peas received on the market in late February. At the time when the several-pod sample was brought to us for identification, the peas had already been distributed through trade channels. Although it was thus

impossible to determine the extent to which the disease was present, the produce inspector who examined the car reported that approximately 18 percent of the pods showed small brown sunken spots. We had not previously seen this disease on the market.

PEARS

In 3 cars of Anjou Pears from Washington, cork affected from 3 to 10 percent of the fruit. Most cases were mild with but little dimpling of the surface. However, affected areas were scattered throughout the flesh. An occasional lot of Anjou pears arriving from Argentina in March showed small percentages of the same trouble.

Blue mold rot (Penicillium expansum) was the most important decay of western-grown pears, affecting an average of about 2.5 percent of the fruit arriving during the first three months of the year.

POTATOES

A few California potato tubers forwarded for diagnosis from the Buffalo market in mid-July were found affected with a shallow, slightly soft, cream-colored stem-end decay. Isolations uniformly yielded Sclerotium bataticola (Rhizoctonia bataticola). Aside from minor variations in the size of the sclerotia the potato isolates were found identical with those recently obtained from garlic, honey dew melon, onion, and sweet potato. Although the pathogen has been reported on potato in Cyprus, India, and Palestine, a preliminary search of the literature indicates that the only previous report for the United States is that of Boyd (Plant Disease Reporter 11:p.75, July 15, 1927), who found it affecting both tubers and vines in a Georgia field.

SPINACH

Texas spinach arriving during the first three months of the year showed three important market troubles, namely, budworm injury, downy mildew (Peronospora effusa), and white rust (Albugo occidentalis).

Of 318 carlots examined by market inspectors 1/ only 63 were free of one or more of these troubles. Budworm injury was reported in 150 cars with an average of 16 percent of the plants affected. Downy mildew was found in 106 cars with an average of 13 percent of the spinach affected. So far as the market occurrence of white rust is concerned this has undoubtedly been the worst year since the disease was first observed in 1937. An average of 18 percent of the plants in 69 carloads (about 22 percent of the total carloads inspected) had from 2 to 5 outer leaves affected with the disease.

TOMATOES

Phomopsis rot was again observed in Texas tomatoes arriving on the market in early July. The decay was also noted in a carlot of Mississippi tomatoes that arrived about the same time.

WATERMELONS

The chief defects of southern watermelons received on the market during June, July, and August were bruising, anthracnose (Colletotrichum lagenarium), and stem-end decay (Diplodia spp.).

Bruising consisted chiefly of chafing injury where the melons had rubbed against the side of the car, or pressure bruises where melons were in contact with the car floor. No evidence of chemical injury was noted during the course of several visits to the unloading yards.

Although anthracnose was prevalent in high percentage, it occurred in early stage and was therefore chiefly a rind blemish.

A special effort was made to determine how extensively bordeaux paste was being used for controlling stem-end rot. In relatively few cars was there any evidence of its use.

Through the courtesy of the Railroad Perishable Inspection Agency, a random sample of 50 inspection reports were examined for each of the three months, June, July, and August. Practically all June cars were from Florida. Those received in July and August represented a number of southern States with Georgia predominating in July and North Carolina in August. The information obtained from the inspection records for the 150 carlots may be summarized as follows:

Decay was noted in 25 cars with an average of about 5 percent, mostly stem-end decay. On the basis of the total 150 cars, the average incidence of decay was approximately 0.5 percent. There was little difference in amount of decay during the different months.

Anthracnose was noted in 16 cars in June, 38 cars in July, and 46 cars in August, with an average of 14 percent in the 100 cars. On the basis of the total 150 cars, the average incidence was about 9 percent.

Stem-end treatment with bordeaux paste was noted in 16 cars in June, 7 cars in July, and 8 cars in August. In many cases less than half of the melons in the car showed evidence of treatment. From this it can be seen that only about 20 percent of the 150 cars showed evidence of stem-end treatment.

Rejection of melons by receivers on account of decay - The information noted above was based on an inspection of exposed melons before unloading. Actual counts of melons rejected by receivers on account of decay were found to be 13 melons per car in 40 cars in June, 27 melons per car in 44 cars in July, and 72 melons per car in 44 cars in August. Assuming that an average of 925 melons are loaded per car, approximately 3.5 percent of the melons in all 150 cars were rejected for decay. By months the rejected melons averaged about 1 percent in June, 2.5 percent in July, and 7 percent in August.

(DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES)

GRASS DISEASES IN WISCONSIN IN 1941[1/]

J. Lewis Allison and D. W. Chamberlain

This report of grass diseases deals primarily with those diseases found in the grass nurseries at Madison, Wisconsin. It includes, however, diseases which have been collected or observed on other common grasses in various regions of the State.

Weather conditions during the late spring and early fall were favorable for the development and spread of many of the foliage diseases.

1/ Cooperative investigations of the Wisconsin Agricultural Experiment Station and the Division of Forage Crops & Diseases, Bureau of Plant Industry, U. S. Department of Agriculture.

The leaf rusts of blue grasses caused by Puccinia poae-sudeticae and P. rubigo-vera reached epiphytotic development early in the season and were especially severe during the fall. Anthracnose and leaf blight of Sudan grass caused by Colletotrichum graminicolum and Helminthosporium turcicum were extremely prevalent in the Sudan grass nursery. Many lines were completed defoliated by these two fungi during the early fall. Ideal environment for disease development, plus the fact that the Sudan grass nursery has been grown on the same plot for 11 consecutive years, permitting a gradual build up of inoculum, were likely responsible for the severe attack by these two fungi. Other common grass pathogens did not attain the epiphytotic development that was evident during 1940. Powdery mildew of blue grass (Erysiphe graminis) especially, was much less severe than in previous years.

The relative severity of the principal types of diseases on pasture grasses grown at Madison, Wisconsin is given in Table 1. The 1941 collections and observations are summarized in a host index.

Table 1. Relative Severity of the Principal Types of Diseases on Pasture Grasses at Madison, Wisconsin.[a/]

Common name of grass	The diseases and their relative severity						
	Mildew	Ergot	Leaf Rust	Stem Rust	Smuts	Leaf Spots	Anthracnose
Bluegrass, Kentucky	S	L	S	-	L	M	-
Bluegrass, Canada	-	-	-	L	-	S	-
Brome, smooth	-	M	-	-	-	S	-
Redtop	-	-	L	-	-	L	-
Timothy	-	-	-	L	M	L	-
Reed Canary	-	L	-	-	-	L	-
Quack Grass	-	M	L	S	L	L	-
Sudan Grass (annual)	-	-	-	L	L	S	S

a/ Rated as Severe (S), Moderate (M), and Light (L).

Host Index

Agropyron repens (L.) Beauv.
Ergot - Claviceps purpurea (Fr.) Tul.
Tar spot - Phyllachora graminis (Pers.) Fckl.
Leaf smut - Urocystis agropyri (Preuss.) Schröt.
Stem rust - Puccinia graminis Pers.
Leaf rust - P. rubigo-vera (DC.) Wint.
Leaf spot - Septoria agropyri Ell. & Ev.
*Bends - Cause undetermined.

Agropyron smithii Rydb.
Ergot - Claviceps purpurea (Fr.) Tul.
Stem rust - Puccinia graminis Pers.

Agrostis alba L.
Leaf rust - Puccinia rubigo-vera (DC.) Wint.
Brown stripe - Scolecotrichum graminis Fckl.

Bromus inermis Leyss.
Bacterial spot - Phytomonas coronafaciens (Elliott) Bergey et al. var. atropurpurea (Reddy & Godkin) Magrou
Ergot - Claviceps purpurea (Fr.) Tul.
Leaf spot - Selenophoma bromigena (Sacc.) Sprague & Johnson
Leaf spot - Septoria bromi Sacc.
Leaf spot - Helminthosporium bromi Drechs.
Leaf scald - Rhynchosporium secalis (Oud.) Davis
Leaf spot - Cause undetermined, probably non-parasitic
*Bends - Cause undetermined
**Head proliferation - Cause not definitely known; a Sclerospora sp. was observed in some heads.

Dactylis glomerata L.
Powdery mildew - Erysiphe graminis DC.
Ergot - Claviceps purpurea (Fr.) Tul.
Brown stripe - Scolecotrichum graminis Fckl.

Elymus canadensis L.
Mildew - Erysiphe graminis DC.
Tar spot - Phyllachora graminis (Pers.) Tul.
Leaf smut - Urocystis agropyri (Preuss.) Schröt.
Stem rust - Puccinia graminis Pers.
Leaf spot - Septoria elymi Ell. & Ev.
Brown stripe - Scolecotrichum graminis Fckl.

Hordeum jubatum L.
Mildew - Erysiphe graminis DC.
Head smut - Ustilago bullata Berk.
Stem rust - Puccinia graminis Pers.
Leaf rust - Puccinia rubigo-vera (DC.) Wint.
Brown stripe - Scolecotrichum graminis Fckl.

Panicum virgatum L.
Tar spot - Phyllachora graminis (Pers.) Tul.
Leaf rust - Puccinia panici Diet.
Leaf rust - Uromyces graminicola Burrill
*Bends - Cause undetermined

Phalaris arundinacea L.
Powdery mildew - Erysiphe graminis DC.
Ergot - Claviceps purpurea (Fr.) Tul.

Phleum pratense L.
Stripe smut - Ustilago striaeformis (Westend.) Niessl
Stem rust - Puccinia graminis Pers.
Leaf rust - P. rubigo-vera (DC.) Wint.
Brown stripe - Scolecotrichum graminis Fckl.

Poa compressa L.
Stem rust - Puccinia graminis Pers.
Brown stripe - Scolecotrichum graminis Fckl.

Poa pratensis L.
Powdery mildew - Erysiphe graminis DC.
Ergot - Claviceps purpurea (Fr.) Tul.
Stripe smut - Ustilago striaeformis (Westend.) Niessl
Leaf rust - Puccinia rubigo-vera (DC.) Wint.
Leaf rust - P. poae-sudeticae (Westend.) Jørstad
Leaf spot - Septoria sp.
Leaf spot - Helminthosporium vagans Drechs.

Setaria lutescens (Weigel) F. T. Hubb
Downy mildew - Sclerospora graminicola (Sacc.) Schröt.
Head smut - Ustilago neglecta Niessl
Leaf spot - Piricularia grisea (Cke.) Sacc.

Sorghum vulgare Pers. var. sudanense (Piper) Hitchc.
Bacterial spot - Phytomonas andropogoni (E. F. Smith) Bergey et al.
Kernel smut - Sphacelotheca sorghi (Lk.) Clint.
Leaf rust - Puccinia purpurea Cke.
Leaf blight - Helminthosporium turcicum Pass.
Anthracnose - Colletotrichum graminicolum (Ces.) Wilson
Leaf spot - Cause undetermined, probably non-parasitic
*Bends -Cause undetermined

* This is the first report on these hosts for this peculiar malformation which has been called "Hairpin disease" and more recently "Bends."

** This proliferated head malformation is in some respects similar to that described as crazy top in corn for which no causal organism has been reported. Symptoms on smooth brome agree with those caused by downy mildew on various grasses and there is one report in the literature of a downy mildew on Bromus commutatus Schrad. Head proliferation of several grasses has been reported by some as resulting from adverse environmental conditions.

CROWN GALL ON THE WEED, MALVA ROTUNDIFOLIA

E. M. Hildebrand and L. M. Massey

During the autumn of 1941 fleshy galls were noticed just above ground level on a considerable number of plants of the common round-leaved mallow (Malva rotundifolia L.) on the south side of the Plant Science Building at Cornell on a spot of lawn where for some unknown reason the lawn grass was rather thin and the weed very abundant. The galls were located at the crowns where wounds could have been produced by the lawn mower during the growing season. In size they ranged from a few millimeters to over an inch in diameter. Many of the older galls were in an advanced state of decay.

The bacteria isolated from the young light-color galls were typical of the crown gall organism in culture and when inoculated into tomato induced galls apparently identical to those induced by a stock culture of this organism [Phytomonas tumefaciens].

Other species of the Malvaceae (Mallow family) known to be crown gall suscepts, according to the literature, are the hollyhock (Althaea rosea Cav.) and rose mallow or swamp hibiscus (Hibiscus moscheutos L.).

(NEW YORK STATE COLLEGE OF AGRICULTURE)

CHECK LIST REVISION

Freeman Weiss

PRUNUS. APRICOT, CHERRIES, and PLUMS, including ornamentals. For almond and peach see Amygdalus.

Occurring on various or undetermined Prunus spp.

Alternaria sp., fruit rot. On P. cerasifera, Mich.; on P. domestica, Idaho & Oregon.

A. citri Ell. & Pierce, blossom end rot, fruit spot. On P. armeniaca, Calif. Var. cerasi Rudolph, leaf spot. On P. avium. Calif.

Armillaria mellea Vahl ex Fr., root rot. Cosmopolitan.

Botrytis cinerea Pers., blossom blight, green & ripe fruit rot, gummosis. Cosmopolitan.

Cercospora cerasella Sacc., leaf spot. Conidial stage of Mycosphaerella cerasella.

C. circumscissa Sacc. (C. graphioides Ell.), leaf spot, shot-hole. Widespread.

Cladosporium carpophilum Thüm., scab, usually of fruit, sometimes of foliage & twigs. On Prunus spp. other than P. cerasus. Widespread.

(Clasterosporium carpophilum (Lév.) Aderh.): Coryneum carpophilum

Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.

Coccomyces hiemalis Higgins (Cylindrosporium hiemalis Higgins), leaf spot, shot hole. Chiefly on P. avium, P. cerasus, P. pensylvanica. General. (This and the following 2 spp. have been placed in a

PRUNUS -- continued.

new genus Higginsia by Nannfeldt, and the conidial stage is said to be related more closely to Marssonina than to Cylindrosporium.)

C. lutescens Higgins (Cylindrosporium lutescens Higgins), leaf spot. Chiefly on P. mahaleb, P. serotina, P. virginiana. Widespread.

C. prunophorae Higgins (Cylindrosporium prunophorae Higgins), leaf spot, shot hold. Chiefly on P. americana, P. domestica, P. salicina. Widespread.

Cornularia persicae (Schw.) Sacc., on branches. N.Y., N.Car., Va., Vt.

Corticium stevensii Burt, thread blight. Fla.

Coryneum carpophilum (Lév.) Jauch (C. beijerinckii Oud.), blight, gummosis, pustular spot. Widespread, especially in Pacific Coast States. (Ascospora beijerinckii Vuill., on mummied fruits, has been reported but not confirmed as the ascogenous stage; not recorded in the U.S.)

Cylindrosporium spp. (especially C. padi of American authors). Conidial stages of Coccomyces spp.

Cytospora cincta Sacc. and C. leucostoma Sacc., dieback, twig canker. Conidial stages respectively of Valsa cincta and V. leucostoma. (Other Cytospora spp. reported but probably saprophytic).

Daedalea confragosa Bolt. ex Fr. and D. unicolor Bull. ex Fr., wood rot. Occasional.

Dermatea cerasi Pers. ex Fr. (Micropera drupacearum Lév.), on branches. Widespread. D. prunastri Fr. (Sphaeronema spurium Sacc.), frequently reported, is probably a synonym.

Diaporthe spp., on branches, ? canker. Spp. reported include D. eres Nits. on Prunus spp., D. decorticans (Lib.) Sacc. & Roum. on P. cerasus, D. pennsylvanica (Berk. & Curt.) Wehmeyer on P. pensylvanica & P. virginiana; D. pruni Ell. & Ev. On P. serotina & P. virginiana; D. prunicola (Pk.) Wehmeyer on P. pensylvanica & P. serotina.

Dibotryon morbosum (Schw.) Theiss. & Syd., black knot. General.

Erwinia amylovora (Burr.) Winslow et al., twig blight. Occasional on various Prunus spp., especially P. armeniaca; sometimes also on P. avium and P. domestica, chiefly on fruit.

Exoascus spp. See Taphrina.

Fomes spp., wood rot, sometimes butt & heart rot of living trees. Spp. reported include F. annosus (Fr.) Cke., N.E. States; F. applanatus (Pers. ex Fr.) Gill., white butt & heart rot, Oregon; F. fomentarius (L. ex Fr.) Kickx, N.E.States; F. fraxinophilus (Pk.) Sacc., Oregon; F. fulvus (Scop. ex Fr.) Gill. (F. pomaceus Pers. ex Lloyd), brown cubical heart rot, widespread; F. igniarius (L. ex Fr.) Kickx, white spongy rot often following black knot, Idaho, Mont.; F. marmoratus Berk., S. Car.; F. pinicola (Sw. ex Fr.) Cke., brown crumbly rot, widespread; F. roseus (Alb. & Schw. ex Fr.) Cke., Oregon; F. subroseus (Weir) Overh., brown cubical heart rot, Pacific Coast States.

PRUNUS -- continued.

Fusicladium cerasi (Rabh.) Sacc., scab. On P. cerasus. N.Y. to Iowa & Wis. Conidial stage of Venturia cerasi Aderh., authentic records of the occurrence of which are not available in the U.S. Also reported on P. americana but this should probably be Cladosporium carpophilum.

Heterodera marioni (Cornu) Goodey, root knot. Southern States, Ariz.

Irpex lacteus Fr., white spongy rot. Widespread.

Lenzites spp., brown sapwood or sometimes heart rot of living trees. L. betulina L. ex Fr., Mich. & N.Y.; L. saepiaria Wulf. ex Fr. and L. trabea Pers. ex Fr., Idaho, Oregon, & Wash.

Leptothyrium pomi (Mont. & Fr.) Sacc., fly speck (on fruit). Eastern and Central States.

Massaria conspurcata (Wallr.) Sacc., on dead branches. Widespread.

Micropera drupacearum Lév., on twigs. Conidial stage of Dermatea cerasi.

Monilia spp., brown rot, blossom & twig blight. Conidial stages of Monilinia (Sclerotinia) spp.

Monilinia demissa (Dana) Honey, shoot blight. On P. virginiana var. demissa. Idaho, Wash.

M. fructicola (Wint.) Honey, brown rot, blossom blight. On all cult. and various native Prunus spp. General.

M. laxa (Aderh. & Ruhl.) Honey, blossom & twig blight, brown rot. On cult. Prunus spp. Pacific Coast States.

M. seaveri (Rehm) Honey, shoot blight, seedling blight. On P. serotina. Eastern States to Ark. & Iowa.

Mycosphaerella cerasella Aderh. (Cercospora cerasella Sacc.), leaf spot. Eastern and Southern States to Kans.

Nectria sp., trunk & branch canker. On P. serotina & P. pensylvanica. N.E. States.

N. cinnabarina Tode ex Fr., coral spot, dieback. Widespread.

Penicillium spp., blue mold rot. On prunes & cherries. Pacific Northwest.

Phomopsis mali Roberts, bark canker. Va. (Conidial stage of Diaporthe eres ?)

P. padina (Sacc. & Roum.) Died., canker, twig blight. On P. cerasus, N.Y. & Pa. (Conidial stage of Diaporthe decorticans.)

Phoradendron flavescens (Pursh) Nutt., mistletoe. On various Prunus spp. in Central and Southern States. Var. macrophyllum Engelm., Ariz.

Phyllosticta circumscissa Cke. (? P. persicae Sacc.), leaf spot, shot-hole. Widespread.

P. congesta Heald & Wolf, leaf blotch. Ill., Texas, Wis.

P. serotina Cke., leaf spot. N.J. to Ala. & Wis.

P. virginiana (Ell. & Holw.) F.Tassi, leaf spot.* Iowa to Kans. & Mont.

Phymatotrichum omnivorum (Shear) Dug., root rot. On all tested Prunus spp., Texas, Ariz., Okla.

Physalospora spp., on branches. P. fusca N.E.Stevens, S.Car.; P. obtusa (Schw.) Cke., widespread; P. rhodina (Berk. & Curt.) Cke., S.Car.

* This combination by Tassi antedates Seaver's, which is usually cited.

PRUNUS -- continued.

Phytomonas pruni (EFS.) Bergey, bacterial spot, black spot of leaves & fruit, canker. On all cult. Prunus spp., less on native spp. Widespread.

P. syringae (van Hall) Bergey (P. cerasi (Griffin) Bergey), canker, gummosis. Especially on Prunus avium, Pacific Coast States and occasionally in East.

P. tumefaciens (EFS. & Town.) Bergey, crown gall. Widespread.

Phytophthora cactorum (Leb. & Cohn) Schroet., collar rot. Calif., Ind.

P. citrophthora (R.E. & E.H. Smith) Leonian, trunk canker. Calif.

(Plowrightia morbosa (Schw.) Sacc.): Dibotryon morbosum.

Podosphaera oxyacanthae (DC.) DBy., powdery mildew. General. Var. tridactyla (Wallr.) Salm., often reported but confirmed only in Pacific Northwest.

Polyporus spp., wood rot, sometimes root, butt, or heart rot of living trees. Spp. reported include P. cinnabarinus Jacq. ex Fr., widespread; P. dryophilus Berk. (P. rheades Pers. ex Fr.), Me., Mich.; P. galactinus Berk., N.Y., Oregon; P. gilvus (Schw.) Fr., white sap & heart rot, widespread; P. hirsutus Wulf ex Fr., white spongy sap rot, widespread; P. lacteus Fr., white heart rot, widespread; P. pargamenus Fr., white sap rot, widespread; P. sulphureus Bull. ex Fr., brown butt & heart rot, N.E. States; P. supinus Sw. ex Fr., Southern States; P. tulipiferus (Schw.) Overh., N.E.States; P. versicolor L. ex Fr., white spongy sap rot, widespread.

Poria spp., white spongy rot of dead wood, sometimes root & heart rot of living trees, especially P. ambigua Bres., root rot, Calif., P. prunicola (Murr.) Sacc. & Trott., P. pulchella (Schw.) Cke., P. vaporaria Fr. and P. versipora Pers. ex Romell, chiefly on P. serotina, North Central and Eastern States.

Schizophyllum commune Fr., wood rot, sometimes on living trees. Cosmopolitan.

Sclerotinia spp., brown rot, blossom & twig blight. See Monilinia.

S. sclerotiorum (Lib.) DBy., green rot, shoot blight. Calif.

Septobasidium burtii Lloyd, felt (on branches infested by scale insects). S.Car. to La.

(Septoria cerasina Pk.): Cylindrosporium lutescens Higgins.

S. pruni Ell. and S. purpureocincta Ell. & Ev., leaf spot. On P. americana, Kans.

(Sphaeronema spurium Sacc.): Micropera drupacearum.

Sphaeropsis spp., on twigs. S. peckii Sacc., Kans. & N.Dak.; S. cerasina Pk., N.Y. Conidial stage of Physalospora sp.

Sphaerotheca pannosa (Wallr.) Lev. var. persicae Wor., powdery mildew. N.Y.

Stereum spp., wood rot, sometimes wound or heart rot of living trees. S. hirsutum Willd. ex Fr. widespread; S. rameale Schw., top rot, N.Y., Pa.; S. sericeum Schw., N.Car., W.Va.

S. purpureum Pers., heart rot, silver leaf. N.Y., Pacific Coast States.

PRUNUS -- continued.

Taphrina cerasi (Fckl.) Sadeb., witches'-broom. On P. avium & P. cerasus. Widespread.

T. communis (Sadeb.) Gies., pockets, bladder plums, shoot hypertrophy. On P. americana, P. nigra, and ? other native plums. Widespread.

T. confusa (Atk.) Gies., hypertrophy of fruit, leaf & shoot. On P. virginiana. N. E. States to Wis.

(T. decipiens (Atk.) Gies.): T. communis.

T. farlowii Sadeb., hypertrophy of fruit, leaf & shoot. On P. serotina. N.E.States to Texas.

T. flavorubra Ray, hypertrophy of fruit, leaf & shoot. On P. pumila. N.Y.

T. insititiae (Sadeb.) Johans., witches'-broom. On P. domestica, Eastern States; ? on P. pensylvanica, widespread.

T. longipes (Atk.) Gies., hypertrophy of fruit. On P. americana. Mich., N.Y.

T. mirabilis (Atk.) Gies. (and var. tortilis Atk.), hypertrophy of fruit, leaf & shoot. On P. angustifolia, P. hortulana & P. munsoniana. Central & Southern States.

T. pruni (Fckl.) Tul., pockets. On P. domestica. Widespread.

T. pruni-subcordata (Zeller) Mix, hypertrophy of fruit, leaf & shoot. On P. subcordata. Calif., Oregon.

T. rhizipes (Atk.) Gies., hypertrophy of fruit, leaf & shoot. On P. salicina. Ala.

Trametes hispida Bagl., wound rot, heart rot. Colo., Oregon, Wyo.

Tranzschelia pruni-spinosae (Pers.) Diet., rust (II,III). General. Two vars. are distinguished: (1) typica (Fisch.) Dunegan, on various native Prunus spp. and occasionally on cult. plums; 0 and 1 on Anemone, Hepatica, Ranunculus, Thalictrum etc.; (2) discolor Dunegan, on apricot, peach & cult. plums; 0 and I on Anemone coronaria.

Valsa cincta Fr. and V. leucostoma Pers. ex Fr. (Cytospora cincta Sacc. and C. leucostoma Sacc.), dieback, twig canker. Widespread.

Verticillium albo-atrum Reinke & Berth., black heart, wilt. On P. armeniaca. Calif.

Virus diseases:

Buckskin, - unidentified virus. On P. avium, Calif.

Crinkle, - unidentified virus, possibly vein-clearing. On P. avium. Oregon, Wash.

Dwarf, - Prunus virus 6 Thomas & Hildebrand (Nanus pruni Holmes). On P. domestica. N.Y.

Line-pattern virosis, - Marmor lineopticum Cation. On P. salicina & P. mahaleb. Calif., Ky., Mich., Ohio; ? on P. americana, Minn.

Little peach, - Prunus virus 1A Smith (chlorogenus persicae var. micropersicae Holmes). On P. munsoniana, P. salicina & P. simonii vars., sometimes masked.

Mosaic, cherry, - unidentified virus. On P. avium, Calif.

PRUNUS -- continued.

Mosaic, peach, -- Prunus virus 5 Hutchins ex Smith (Marmor persicae Holmes). On P. armeniaca, P. domestica, P. salicina & others; sometimes masked. Calif.
Mosaic, Winters peach, - unidentified virus. On P. armeniaca. Calif.
Mottle leaf, - Prunus virus 7 (Marmor cerasi Zeller & Evans) On P. avium. Calif. to Wash. & Idaho.
Rosette, - Prunus virus 2 McClintock ex Smith (Nanus rosettae Holmes). On various Prunus spp. Ga. to Okla. & Kans.
Rusty mottle, - Marmor rubiginosum Reeves. On P. avium. Wash.
Vein-clearing, - Prunus virus 8 (Marmor nerviclarens Zeller & Evans) On P. avium, P. domestica, P. serrulata. Oregon, Wash.
Yellow-red virosis, - Marmor lacerans Holmes. On P. virginiana, Conn. to Ill. On P. virginiana var. demissa, Oregon, Wash.; on var. melanocarpa, Idaho, Utah.
Yellows, peach, - Prunus virus 1 Kunkel ex Smith (Chlorogenus persicae var. typica Holmes). On P. armeniaca and P. salicina & other plums. Eastern States.
Yellows, cherry (yellow leaf), - unidentified virus. On P. cerasus. Mich., N.Y., Wis.

(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

TEMPERATURE AND PRECIPITATION FOR THE YEAR 1941 AND FOR DECEMBER

(U. S. Department of Commerce, Weather Bureau, Weekly Weather and Crop Bulletin for the weeks ending January 6 and January 13, 1942).

1941 ANOTHER WARM YEAR: (January 6) Following the general trend since the turn of the century, and especially during the last couple of decades, the year 1941 was warmer than normal in practically all parts of the country. The tendency to above-normal temperature was markedly in evidence in all seasons of the year. The winter was slightly colder than normal in parts of the Atlantic area, but in all other sections above-normal warmth prevailed, the plus departures being especially large in the western half of the country.

The spring season (March-May) had slightly below normal temperatures in the South and most Appalachian Mountain sections, but was substantially warmer than normal throughout the northern half of the country, the largest plus departures, 3° to 5°, appearing from the central Mississippi Valley northward and northwestward.

The summer was somewhat cooler than normal in the Southwest and parts of the Great Basin, also in most of central California; elsewhere it was warmer than normal, with the greatest plus departures in the same area as in the spring. The fall season (September-November) had less than normal warmth in most areas west of the Rocky Mountains, but in all other

sections the seasonal means were above normal, substantially so in most areas.

In January the lowest temperature recorded was -43° at Taylor Park, Colo., and in Alaska, -65° at Fort Yukon. The United States lowest in February was -40° at Edmore, North Dakota, and in Alaska, -42°, again at Fort Yukon. As late as March 10, a temperature of -56° was reported from Allakaket, Alaska.

The highest temperature recorded for the year was 124° at two stations in California, Cow Creek and Greenland Ranch, both in Inyo County. These stations are in the vicinity of Death Valley. The highest reported from Alaska was 91° at Circle Hot Springs.

Figure 1 (A) shows that for the year, as a whole, a very limited area in the interior of the Northeast had slightly below normal temperature. Elsewhere the yearly averages were above normal, with the largest plus departures in the north-central portion of the country from the Ohio and middle Mississippi Valleys northward and northwestward where the annual means were from 2° to nearly 5° in excess of normal.

PRECIPITATION FOR THE YEAR 1941: (January 13) In addition to being a year of abnormal warmth, 1941 was outstanding for heavy precipitation. The last half of the year was especially wet nearly everywhere west of the Mississippi River. Oklahoma, Kansas, New Mexico, Utah, Nevada, and California all had more than one and one-half times the normal rainfall for this 6-month period. The only States having deficiencies were those from North Carolina and Tennessee northward and most of these had nearly normal precipitation.

An outstanding feature of the year's precipitation was the abnormally heavy falls over the western two-thirds of the country; Figure 2(A) shows 5 southwestern States with more than 150 percent of the normal annual amounts. West of the Mississippi River only Arkansas and Washington had deficiencies, and these were small. On the other hand, the Middle Atlantic States, especially Virginia, were abnormally dry.

It was the wettest year of record in North Dakota, Utah, and New Mexico, the last named having about a third more precipitation than is of record for any previous year. It was the second wettest year of record in Nevada, Arizona, Texas, Oklahoma, and Kansas, and the third wettest in California. On the other hand, for the rather limited dry eastern area, Tennessee had the driest year of record, Kentucky, Virginia, and Maryland-Delaware the second driest, and North Carolina the third. For the country, as a whole, the average 1941 annual precipitation was 32.36 inches, or nearly 12 percent above normal. There have been only 2 wetter years in the climatological history of the United States, 1905 with a country-wide average of 32.69, and 1915 with 32.74.

Interesting aspects of the year's precipitation were the heavy amounts in western areas, where the 1930 decade was so dry and dusty, and a reversal, with regards to normal conditions, for the midwest and the more humid eastern sections. For example, Kansas had more precipitation than either of the Virginias, Maryland, Ohio, Indiana, Kentucky, and even Tennessee.

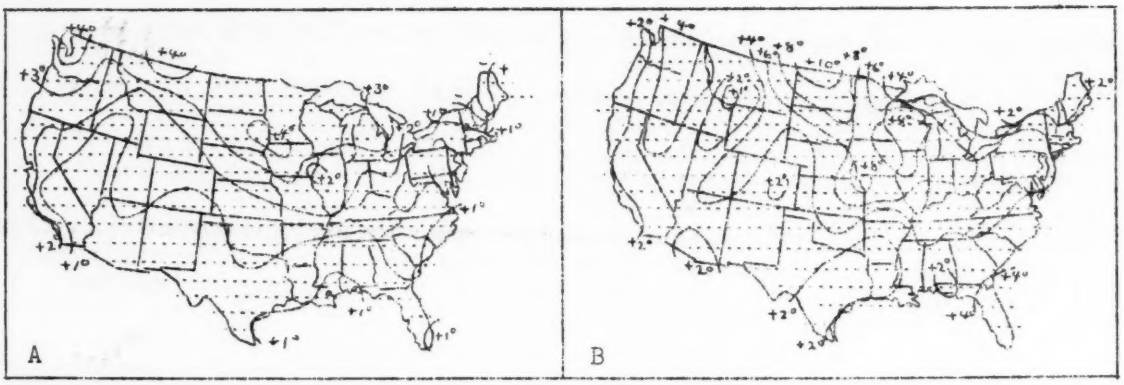

Fig. 1. - Departure from the normal temperature for the year 1941 (A), and for December 1941 (B).
Shaded: Above normal.

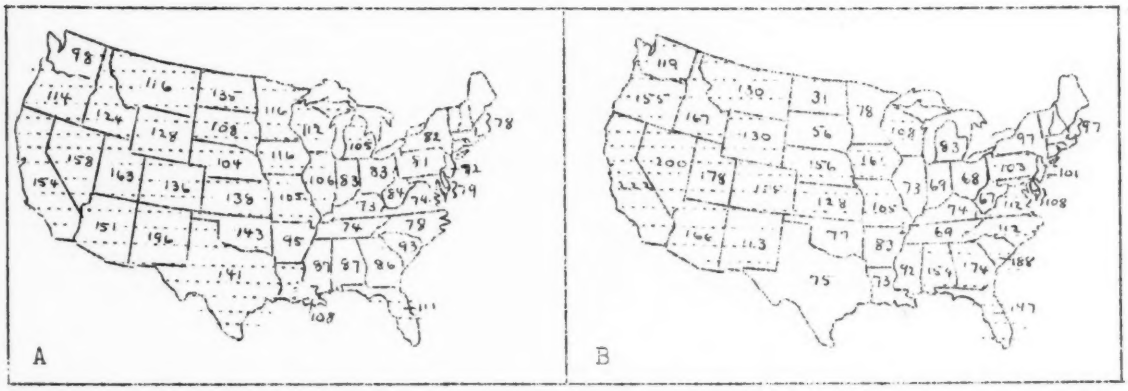

Fig. 2. - Percentage of normal precipitation by States, for the year 1941 (A), and for December 1941 (B).
Shaded: Normal or above.

DECEMBER TEMPERATURES: (January 6) Temperatures in the United States in December, the final month of 1941, were in keeping with the general tendency for the preceding months of the year, in that the means were above normal in practically all sections of the country. For the month, as a whole, a few scattered stations had approximately normal warmth, but in nearly all sections the means ranged from 2° to about 10° above normal, see Figure 1 (B). The extreme Northeast, the Southern States, and Pacific coast districts had the smallest plus departures, mostly 2° or 3°, and the area from the Ohio and central Mississippi Valleys and southern Great Plains northward the largest, generally 5° to 11°.

The average monthly temperatures for December 1941 were quite similar to those for December 1940, except they were considerably higher in central-northern sections, including Michigan, the upper Mississippi Valley, and most of the northern Plains where December 1941 was mostly from 4° to 6°

warmer than December 1940. Also, in a considerable southwestern area, extending from western Texas to the Pacific coast, the means were generally 2° or 3° lower than last year. Elsewhere they were substantially the same.

DECEMBER PRECIPITATION: (January 13) Figure 2 (B) shows that December 1941, was abnormally wet in the Southeastern States, the central trans-Mississippi area, and everywhere west of the Rocky Mountains. In the Southeast, South Carolina and Georgia show the relatively greatest excesses; in the Midwest, Iowa and Nebraska, and in the far West, California and Nevada, much of the last two having more than twice the normal. A central-northern area, centering in North Dakota, was extremely dry, and all States, in general, from Louisiana and Texas northeastward to the Lake Region and New England had less than normal precipitation. California, with an average State rainfall of 8.14 inches, had an unusually wet December, the month being among the wettest of record for the State. Georgia had the third wettest of record.